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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/392,124	09/08/1999	DOUGLAS A. CHRISSAN	8X8S.239PA	9597

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EXAMINER
AZAD, ABUL K

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 10/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/392,124	CHRISSAN ET AL.	
	Examiner	Art Unit	
	ABUL K. AZAD	2654	

-- The MAILING DATE of this communication appears on the cover sheet,with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. This action is in response to the communication filed on August 5, 2002.

2. Claims 1-32 are pending in this action.

3. The applicant's arguments with respect to claims 1-32 have been fully considered but they are not deemed to be persuasive. For examiner's response to the applicant's arguments or comments, see the detailed discussion in the Response to the Arguments section.

4. In view of applicant's arguments the rejection to claim 28 under 35 U.S.C §112, first paragraph is hereby withdrawn.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-27 and 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Bialik et al. (US 5,568,588).

As per claim 1, Bialik teaches, "in a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, a method of analyzing the input speech signal comprising:"

"generating from the target vector and the short term characteristics, a plurality of sequences of variable-amplitude pulses, each of the sequences having a different average amplitude value" (col. 4, lines 12-51); and

"outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42).

As per claim 2, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 3, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"means for generating from the target vector and the short term characteristics, a plurality of sequences of variable-amplitude pulses, each of the sequences having a different average amplitude value" (col. 4, lines 12-52); and

"means for outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42).

As per claim 4, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 5, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response,

generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"an analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable-amplitude pulses, each of said sequences having a different average amplitude value" (col. 4, lines 12-51);

"the analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42).

As per claim 6, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 7, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"a multi-pulse analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable-amplitude, variable-sign and variably-spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs" (col. 4, lines 12-51);

"the multi-pulse analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude, variable-sign, variably-spaced pulses which,

according to a maximum likelihood criterion, most closely represents the target vector" (col. 6, lines 38-42).

As per claim 8, Bialik teaches, " wherein the target vector is matched using a perceptual weighting criterion" (col. 6, line 42-44).

As per claim 9, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 3, line 55 to col. 5, line 65).

As per claim 10, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal" (col. 3, lines 1-27);

"a target vector generator for generating data including a target vector from at least said input speech signal, and optionally, said short-term characteristics" (col. 3, lines 49-57); and

"a multi-pulse analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable amplitude, variable sign, variably-spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs, said multi pulse analyzer for outputting a signal corresponding to the sequence of equal amplitude, variable sign, variably spaced pulses which, according to

a maximum likelihood criterion, most closely represents said target vector" (col. 3, line 58 to col. 4, line 51).

As per claim 11, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion (col. 6, lines 42-44); and

"wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5, line 65).

As per claim 12, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal" (col. 3, lines 6-26);

"a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics" (col. 3, lines 49-57); and "a multi-pulse analyzer connected to an output line of said target vector generator and an output line of said short term analyzer, wherein said multi-pulse analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs, said multi-pulse analyzer for outputting a signal corresponding to the sequence of variable amplitude, variable sign, variably spaced pulses which, according to the maximum likelihood criterion, most closely represents said target vector" (col. 3, lines 48 to col. 4, lines 51).

As per claim 13, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 14, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5, line 54).

As per claim 15, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal" (col. 3, lines 6-12);

"a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics" (col. 3, lines 14-26); and

"a multi-pulse analyzer connected to an output line of said target vector generator and an output line of said short term analyzer, wherein said multi-pulse analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs, said multi-pulse analyzer for outputting a signal corresponding to the sequence of variable amplitude, variable sign, variably spaced pulses which, according to the maximum likelihood criterion, most closely represents said target vector, and one or more pulse sequence modifiers, each having as input at least a sequence of equal amplitude,

variable sign, variably spaced pulses, wherein each said pulse sequence modifier modifies its input sequence and produces as output a sequence of variable amplitude, variable sign, variably spaced pulses" (col. 3, line 58 to col. 4, line 51).

As per claim 16, Bialik teaches, "wherein the pulse sequence modification function is based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5, line 54).

As per claim 17, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal" (col. 3, lines 6-13);

"a long-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the long-term characteristics of the input speech signal" (col. 3, lines 27-35);

"a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics, and optionally, said long-term characteristics" (col. 3, lines 49-57); and

"a pulse-train sequence analyzer connected to at least an output line of said target vector generator and an output line of said short term analyzer, wherein said pulse-train sequence analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulse trains, each of said sequences having a different

average amplitude value, each of said pulse trains within each sequence having variable amplitudes and variable signs, said pulse-train sequence analyzer for outputting a signal corresponding to the sequence of equal amplitude, variable sign, variably spaced pulse trains which, according to the maximum likelihood criterion, most closely represents said target vector" (col. 3, line 58 to col. 4, line 51).

As per claim 18, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5, line 65).

As per claim 19, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col.6, lines 42-44).

As per claim 20, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal" (col. 3, lines 6-13);

"a long-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the long-term characteristics of the input speech signal" (col. 3, lines 27-35);

"a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics, and optionally, said long-term characteristics" (col. 3, lines 49-57); and

"a pulse-train sequence analyzer connected to at least an output line of said target vector generator and an output line of said short term analyzer, wherein said pulse-train sequence analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulse trains, each of said sequences having a different average amplitude value, each of said pulse trains within each sequence having variable amplitudes and variable signs, said pulse-train sequence analyzer for outputting a signal corresponding to the sequence of variable amplitude, variable sign, variably spaced pulse trains which, according to the maximum likelihood criterion, most closely represents said target vector" (col. 3, line 58 to col. 4, line 51).

As per claim 21, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 22, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5, line 65).

As per claim 23, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5, line 65).

As per claim 24, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; and characteristics of the input speech signal" (col. 4, line 55 to col. 5, line 65).

As per claim 25, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal" (col. 3, lines 6-13);

"a long-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the long-term characteristics of the input speech signal" (col. 3, lines 27-35);

"a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics, and optionally, said long-term characteristics" (col. 3, lines 49-57); and

"a pulse-train sequence analyzer connected to at least an output line of said target vector generator and an output line of said short term analyzer, wherein said pulse-train sequence analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulse trains, each of said sequences having a different average amplitude value, each of said pulse trains within each sequence having variable amplitudes and variable signs, said pulse-train sequence analyzer for outputting a signal corresponding to the sequence of variable amplitude, variable sign, variably spaced pulse trains which, according to the maximum likelihood criterion, most closely represents said target vector" (col. 3, line 58 to col. 4, line 51), and

"one or more pulse-train sequence modifiers, each having as input at least a sequence of equal amplitude, variable sign, variably spaced pulse trains, wherein each said pulse sequence modifier modifies its input sequence and produces as output a sequence of variable amplitude, variable sign, variably spaced pulse trains" (col. 3, line 58 to col. 4, line 51).

As per claim 26, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 27, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (Fig. 2).

As per claim 29, Bialik teaches, "wherein the pulse-train sequence modification function is based on a linear function" (col. 4, line 55 to col. 5, line 65).

As per claim 30, Bialik teaches, "wherein the pulse-train sequence modification function is based on the short-term characteristics of the input speech signal" (col. 4, lines 55-65).

As per claim 31, Bialik teaches, "wherein the pulse-train sequence modification is based on the long-term characteristics of the input speech signal" (col. 5, lines 1-15).

As per claim 32, Bialik teaches, "wherein the pulse-train sequence modification function is based on the excitation signal from previous frames" (col. 5, lines 16-40).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bialik et al. (US 5,568,588).

As per claim 28, Bialik does not explicitly teach modifying the pulse train based on the exponential function. Official Notice is taken on the well-known in the art of speech processes to use pulse trains constructed based on the exponential function. It would have been obvious to one of ordinary skill in the art at the time of the invention to use pulse-train sequence modification function is based on the exponential function because output speech quality is greatly increased, and perceptually smooth.

Response to Arguments

9. The applicant argues: "'588 reference does not teaches or suggest every element of the claimed invention. For example, the present invention is directed to subject matter including the limitations concerning ". . . a plurality of sequences of variable-amplitude pulses, each of the sequences having a different average amplitude values". In contrast, the asserted '588 reference does not teach or suggest the claimed invention including at least this aspect".

In response to the applicant's argument the examiner notes that '588 reference teaches above limitation. The '588 reference teaches in equation 6, how amplitude is

calculated based on the gain levels. The '588 reference teaches at col. 4, lines 19-23 reads "the gain level selector receives the gain range produced by gain range determiner and moves through the gain values within the gain range. Its output, on output line, is a current gain level for which sequence of equal amplitude pulses is to be determine" it also teaches at col. 4, lines 36-38, reads "the matcher returns control to the gain level selector to select the next gain level". From above discussion it is clear that '588 reference teaches a plurality of sequences of variable-amplitude (amplitude is determined based on gain selection) pulses, each of the sequences having a different average amplitude (for different gain value) values.

It will be clear to person that Fig. 1 of instant application and Fig. 1 of patent 5,568,588 are same. Also Fig. 2 of instant application and Figs. 2 and 7 of patent 5,568,588 are same. There fore both instant application and patent 5,568,588 discloses same subject matter. Improvement is not shown in the Figure or in the specification.

The applicant further argues: "dependent claims 9 and 16, Applicant fails to see how cited portion of the '558 reference bears any relation whatsoever to the particular subject matter set forth in this claim. With respect to claim 9, for example, the citation do not correspond to the subject matter claimed in regards any of the noted aspects of pulse amplitude variations within a sequence or to any aspect of the claim terms "exponential" or "excitation signal from previous frames". Similarly, with respect to claim 16, the citations do not correspond to subject matter claimed in regards to the claim terms "pulse sequence modification function" or "excitation signal from previous frames".

In response to applicant's argument the claims are not particularly limited to "exponential" or excitation signal from previous frames" or "pulse sequence modification function". Where applicant claimed as "wherein the pulse amplitude variation are based on at least one of: . . . ". Here on of could be "a linear function" or "the short-term characteristics of the input speech signal" or the long-term characteristic of the input signal". From the '588 patent at Fig.1 teaches the pulse amplitude variation are based on at least one of: "a linear function" or "the short-term characteristics of the input speech signal" or the long-term characteristic of the input signal".

As per applicant's request the examiner provided a reference that it is well-known that pulse-train sequence modification function is based on the exponential function.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Abul K. Azad** whose telephone number is **(703) 305-3838.**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Marsha D. Banks-Harold**, can be reached at **(703) 305-4379.**

Any response to this action should be mailed to:

Commissioner for Patents

Washington, D.C. 20231

Or faxed to:

(703) 872-9314

(For informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center's Customer Service Office whose telephone number is **(703) 306-0377.**

Abul K. Azad

October 19, 2002

Vijay Bhawan 10/21/02

VIJAY CHAWAN
PRIMARY EXAMINER